Metadata for Jewel Cave National Monument, Spatial Vegetation Data: Cover type / Association level of the National Vegetation Classification System

Identification_Information:
Citation:
Citation_Information:
Originator:
U.S. Bureau of Reclamation, Remote Sensing and GIS Group, and The Nature Conservancy
Publication_Date: 19980309
Title:
Jewel Cave National Monument Spatial Vegetation Data; Cover Type /
Association level of the National Vegetation Classification System
Geospatial_Data_Presentation_Form: Map
Series_Information:
Series_Name: USGS-NPS Vegetation Mapping Program
Issue_Identification: Jewel Cave National Monument
Publication_Information:
Publication_Place: Denver CO
Publisher: USGS, Biological Resources Division, Center for Biological Informatics
Other_Citation_Details: Created under contract to the USGS-BRD-CBI.
Online_Linkage: http://biology.usgs.gov/npsveg/jeca/index.html#geospatial_veg_info
Description:
Abstract:
The National Park Service (NPS), in conjunction with the Biological Resources Division (BRD) of the U.S. Geological Survey (USGS), has implemented a program to "develop a uniform hierarchical vegetation methodology" at a national level. The program will also create a geographic information system (GIS) database for the parks under its management. The purpose of the data is to document the state of vegetation within the NPS service area during the 1990's, thereby providing a baseline study for further analysis at the Regional or Service-wide level. The vegetation at Jewel Cave National Monument was mapped using 1:16,000 scale U.S. Forest Service Color Aerial Photography acquired August 22, 1993. The mapping classification used two separate classification systems. All natural vegetation used the National Vegetation Classification System (NVCS) as a base. The vegetation classifcation was created after extensive on site sampling and numerical analysis. The vegetation map units were derived from the vegatation classification. Other non-natural or cultural mapping units used the Anderson Level II classification system. The mapped area includes a buffer around the Monument boundary.
Purpose:
This mapping effort originates from a long-term vegetation monitoring program that is part of a larger Inventory and Monitoring (I&M) program started by the National Park Service (NPS). I&M goals are, among others, to map the vegetation of all national parks and monuments and provide a baseline inventory of vegetation. The I&M program currently works in close cooperation with the Biological Resources Division (BRD) of the United States Geological Survey (USGS). The USGS/BRD continues overall management and oversight of all ongoing mapping efforts in close cooperation with the

NPS.
Supplemental_Information:
The purposes of the mapping effort are varied and include the following:
Provides support for NPS Resources Management. Promotes
vegetation-related research for both NPS and USGS/BRD. Provides support
for NPS Planning and Compliance. Adds to the information base for NPS
Interpretation. Assists in NPS Operations.
Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19950912
Currentness_Reference: Source photography date
Status:
Progress: Complete
Maintenance_and_Update_Frequency: None planned
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -103.87
East_Bounding_Coordinate: -103.75
North_Bounding_Coordinate: 43.77
South_Bounding_Coordinate: 43.62
Description_of_Geographic_Extent: Jewel Cave National Monument and about a 2 mile environs around Monument Boundaries - Black Hills, South Dakota,USA
Keywords:
Theme:
Theme_Keyword_Thesaurus: none
Theme_Keyword: National Park Service
Theme_Keyword: U.S. Geological Service
Theme_Keyword: The Nature Conservancy
Theme_Keyword: Aerial Information Systems
Theme_Keyword: Center for Biological Informatics
Theme_Keyword: land cover
Theme_Keyword: vegetation
Theme_Keyword: alliance
Theme_Keyword: association
Theme_Keyword: land use
Theme_Keyword: Environmental System Research Institute
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: Jewel Cave National Monument
Place_Keyword: Black Hills
Place_Keyword: South Dakota
Place_Keyword: USA
Taxonomy:
Keywords/Taxon:
Taxonomic_Keyword_Thesaurus: None
Taxonomic_Keywords: Plant Communities
Taxonomic_Classification:
Taxon_Rank_Name: Kingdom
Taxon_Rank_Value: Plantae
Access_Constraints: None
Use_Constraints:
No warranty, expressed or implied, is made regarding the accuracy or
utility of the data on any other system or for general or scientific purposes.
Any person using the information presented here should fully understand
the data collection and compilation procedures, as described

in the metadata, before beginning analysis. The burden for determining fitness for use lies entirely with the user.

Point_of_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: USGS Biological Resources Division, Center for Biological Informatics
Contact_Person: USGS-NPS Vegetation Mapping Program Coordinator
Contact_Address:
Address_Type: Physical Address
Address: USGS
Address: Biological Resources Division, CBI
Address: Building 810, Room 8000
City: Denver
State_or_Province: Colorado
Postal_Code: 80225-0046
Country: USA
Contact_Address:
Address_Type: Mailing Address
Address: USGS
Address: Biological Resources Division, CBI
Address: PO BOX 25046, DFC, MS302
City: Denver
State_or_Province: Colorado
Postal_Code: 80225-0046
Country: USA
Contact_Voice_Telephone: (303) 202-4220
Contact_Facsimile_Telephone: 303-202-4229
Contact_Facsimile_Telephone: 303-202-4219 (org)
Contact_Electronic_Mail_Address: gs-b-npsveg@usgs.gov
Browse_Graphic:
Browse_Graphic_File_Name: http://biology.usgs.gov/npsveg/jeca/images/jecaveg.gif
Browse_Graphic_File_Description: 170 Kbyte graphic in map composition layout
Browse_Graphic_File_Type: GIF
Data_Set_Credit: USGS, NPS, U.S. BOR, TNC
Native_Data_Set_Environment: UNIX-ARC/INFO

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
These data have a combined total accuracy of 80.0% (confidence interval 75.7% - 84.8%). Individual class accuracies range from 74% to 100% in both errors of commission and omission.
Logical_Consistency_Report:
All polygon features are checked for topology using the ARC/INFO software. Each polygon begins and ends at the same point with the node feature. All nodes are checked for error so that there are no dangling features. There are no duplicate lines or polygons. All nodes will snap together and close polygons based on a specified tolerance. If the node is not with the tolerance it is adjusted manually. The tests for logical consistency are performed in ARC/INFO using certain commands.
Completeness_Report:
All data that can be photo-interpreted is also digitized. This includes features that fall into the NVCS vegetation classification and the Anderson Level II classification. Minimum mapping unit is obstensibly .5 hectares but some low frequency classes below the MMU are included.
Positional_Accuracy:

Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
The horizontal positional accuracy is tested by visual comparison of digital data to the source materials and verifying the location of the data on-screen relative to other data layers in the same geographic area. The base used for this mapping effort is a scanned and registered paper orthophotograph. Visual examination of these data shows them to comply (usually exceed) with national map accuracy standards for 1:24,000 scale products. See Analysis of Accuracy Assessment Procedures.
Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report: There is no accuracy assessment for vertical position.
Lineage:
Methodology:
Methodology_Type: Field
Methodology_Identifier:
Methodology_Keyword_Thesaurus: Ground truthing
Methodology_Keyword: GPS
Methodology_Keyword: field plots
Methodology_Description:
Developmental of Programmatic and Technical Team:
This project required the combined expertise and oversight of several organizations. Oversight and programmatic considerations are managed by the Center for Biological Informatics of the Biological Resources Division of the U.S. Geological Survey. The National Park Service provided additional guidance. The technical responsibilities for the mapping effort were divided between TNC and BOR. TNC responsibilities and deliverables included the following: Create a vegetation classification system based upon field species level data and consistent with the Standard National Classification System at the Alliance or Community Element level Provide documentation that describes the national classes at the local and global levels, with field keys, and field data in a *.dbf format. Provide technical opinion to BOR as the mapping portion of the project proceeds. Provide field notes and site descriptions BOR responsibilities and deliverables included the following: Digital files of vegetation on Compact (CD); including topology and labeling for height, density, and pattern subclasses; location of field sample sites; and locations of sites used for accuracy assessment in Arc/Info format Any ancillary digital files developed during the mapping process Digital FGDC compliant metadata file for each digital file delivered Annotated field site photographs Original mylar overlays of interpreted photographs Hard copy vegetation map Accuracy assessment Final report describing all procedures used in developing the final map and accuracy assessment Planning and Review Meeting An initial meeting was held with all interested parties to discuss several aspects of the mapping effort. Foremost among these was the mapping extent. Vegetation issues particular to the park were addressed. Jewel Cave National Monument was responsible for obtaining permission from adjacent land owners for property access for sampling purposes. Most of the private lands were under some form of grazing or farming. Consequently, sampling on these lands was not necessary. The remainder of the lands within the mapping area are U.S. Forest Service Lands so permission was not necessary. Preliminary Data Collection and Review of Existing Information To reduce duplicating previous work and to help in our effort we collected existing vegetation reports and maps from the staff at Jewel Cave National Monument. These materials were

referenced during the mapping process and the information contained in them was incorporated where it was deemed useful. Because soils also affect the distribution of vegetation, soil maps and soil descriptions were also obtained as reference. These were not converted to a digital file. Digital elevation models (DEM) were obtained to create slope and aspect maps that helped in determining vegetation community distribution. Vegetation Sampling The sampling approach used in this mapping effort was typical of small park sampling, where all polygons within the park boundary are sampled. Two levels of field data gathering were conducted in this park; plots and observations. Plots represented the most intensive sampling of the landscape and used TNC's 'Plot Form'. Observations consisted of brief descriptions and were designed to obtain a quick overview of the landscape without spending a large amount of time at each sample site. Observation points used the 'Observation Form' data sheet. Examples of both 'Plot' and 'Observation' forms are included in the companion report by TNC. Initially, plots were used to describe the vegetation of the park. A total of 28 plots were obtained from July 29 through August 1, 1996. These plots were used by TNC to describe the vegetation associations found within the park. These descriptions are in the companion report by TNC. Map Validation A field trip was conducted in May of 1997 to assess the initial mapping effort and to refine map classes.

Source_Information:
Source_Citation:
Citation_Information:
Originator: Kenny Aerial Mapping Company, Phoenix, AZ
Publication_Date: 19930817
Title:
Aerial photography (CIR and true color) of Jewel Cave National Monument
Geospatial_Data_Presentation_Form: image
Publication_Information:
Publication_Place: Denver, CO
Publisher: USGS Center for Biological Informatics
Other_Citation_Details:
Aerial photography was taken at a scale of 1:16,000. Original media are in the form of positive transparencies. Photointerpretation was done on contact prints of the true color photos.
Online_Linkage: http://biology.usgs.gov/npsveg/jeca/photos.html
Source_Scale_Denominator: 12000
Type_of_Source_Media: Contact paper prints of film transparencies
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19930817
Source_Currentness_Reference: Imagery date
Source_Citation_Abbreviation: jeca Aerial Photos
Source_Contribution:
These aerial photographs were the basis for the photointerpretation process

Source_Information:
Source_Citation:
Citation_Information:
Originator: Unknown
Publication_Date: Unknown
Title: Digital Orthophotograph of Jewel Cave National Monument
Geospatial_Data_Presentation_Form: Remote-Sensing Image
Publication_Information:

Publication_Place: Unknown
Publisher: Unknown
Other_Citation_Details: The digital orthophotograph is a 1:2400 scale image.
Type_of_Source_Media: Cartridge Tape
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: Unknown
Source_Currentness_Reference: Imagery date
Source_Citation_Abbreviation: jeca orthophoto
Source_Contribution: This digital orthophoto provided the project basemap
Source_Information:
Source_Citation:
Citation_Information:
Originator: USGS,BRD,Center for Biological Informatics
Publication_Date: 19960405
Title: Jewel Cave National Monument Sampling and Classification
Geospatial_Data_Presentation_Form: report
Publication_Information:
Publication_Place: Denver, CO
Publisher: USGS, BRD, Center for Biological Informatics
Other_Citation_Details:
This report was generated by the Nature Conservancy under contract to
the USGS, BRD, CBI.
Online_Linkage: http://biology.usgs.gov/npsveg/jeca/methods.pdf
Type_of_Source_Media: Online
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 199510
Source_Currentness_Reference: Ground Condition
Source_Citation_Abbreviation: jeca sample and classification
Source_Contribution: Report summarizing plot data collection effort
Source_Information:
Source_Citation:
Citation_Information:
Originator: USGS/BRD, Center for Biological Informatics
Publication_Date: 199411
Title: Accuracy Assessment Procedures, NBS/NPS Vegetation Mapping Program
Geospatial_Data_Presentation_Form: document
Series_Information:
Series_Name: USGS-NPS Vegetation Mapping Program
Issue_Identification: Jewel Cave National Monument
Publication_Information:
Publication_Place: Denver, CO
Publisher: USGS/BRD, Center for Biological Informatics
Other_Citation_Details:
This report was prepared by Environmental Systems Research Institute;
Redlands, CA, National Center for Geographic Information and Analysis,
University of California, Santa Barbara, CA and The Nature Conservancy,
Arlington, VA under contract from the U.S. Department of Interior National
Biological Survey and National Park Service.
Online_Linkage: http://biology.usgs.gov/npsveg/aa/aa.html
Type_of_Source_Media: electronic document
Source_Time_Period_of_Content:
Time_Period_Information:

Single_Date/Time:
Calendar_Date: 199411
Source_Currentness_Reference: publication date
Source_Citation_Abbreviation: Accuracy Assessment Procedures Documents
Source_Contribution: This document established the procedures and protocols for the accuracy assessment at Jewel Cave National Monument.
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Originator: Department of the Interior
Publication_Date: 19980510
Title:
Jewel Cave National Monument Photo Interpretation and Map Generation Procedures
Geospatial_Data_Presentation_Form: report
Series_Information:
Series_Name: USGS-NPS Vegetation Mapping Program
Issue_Identification: Jewel Cave National Monument
Publication_Information:
Publication_Place: Denver, CO
Publisher: USGS, Biological Resources Division, Center for Biological Informatics
Other_Citation_Details:
Created in large part by Aerial Information Systems, Inc. under contract rom USGS/BRD/CBI.
Online_Linkage: http://biology.usgs.gov/npsveg/jeca/pi_rpt.pdf
Type_of_Source_Media: digital
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19980510
Source_Currentness_Reference: Report date
Source_Citation_Abbreviation: jeca mapping report
Source_Contribution:
Photo interpretation was done by trained interpreters familiar with the vegetation communities of the Monument on overlays registered to the aerial photographs under a stereoscope. Vegetation communities were idendified on the basis of their color, pattern, texture, and location on the landscape and lines were drawn around the communities. The photo interpreters had visited the monument and conferred with the ecologists who performed the vegetation classification and were familiar with the vegetation communities. Not all vegetation associations could be identified on the photography due to size constraints and complexity of the vegetation. Map classes were assigned in these cases and a cross-walk was made to the vegetation classification.
Process_Step:
Process_Description:
Air Photo Interpretation All map classes were interpreted from existing 1:16,000 scale, color photography flown on August 17, 1993. The photographs were acquired from the U.S. Forest Service (USFS). Photointerpretation used the standard identification features such as tone, texture, color, pattern, topographic position, and shadow. In addition, field sample locations and their vegetation descriptions aided in assigning map class to each polygon. All photographs were examined using a stereoscope. Digital elevation models (DEM's) were processed and converted to slope and aspect coverages. These helped to provide additional perspectives of the landscape. Six photographs were interpreted for the entire mapping area. Digital scans of these

photographs are included as .tif files on the CD included with this report.
Process_Date: 199510
Process_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Bureau of Reclamations
Contact_Address:
Address_Type: Physical Address
City: Redlands
State_or_Province: CA
Postal_Code: Unknown
Country: USA
Contact_Voice_Telephone: Unknown
Process_Step:
Process_Description:
In conjunction with the photoverification and field sampling effort, NBS (now USGS, BRD, CBI) personnel performed a locational accuracy test comparing the accuracy of a global positioning system (GPS) versus manual location techniques. The TNC biologist "pin-pricked" all of the sample site locations onto the aerial photos while the NBS staff captured the location using GPS. The "pin-pricked" locations were subsequently input into the GIS database for comparison against the GPS locations for the same site.
Process_Date: 199510
Source_Used_Citation_Abbreviation: JECA CIR Aerial Photography
Source_Used_Citation_Abbreviation: Analysis of Accuracy Assessment Procedures at Jewel Cave National Monument

Spatial_Data_Organization_Information:
Indirect_Spatial_Reference:
Jewel Cave National Monument is in Custer County and is part of the south western Black Hills. The Monument lies 11 miles west of the town of Custer, South Dakota.
Direct_Spatial_Reference_Method: Vector

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 13
Transverse_Mercator:
Longitude_of_Central_Meridian: -105
Latitude_of_Projection_Origin: 0
False_Easting: 500000
False_Northing: 0
Scale_Factor_at_Central_Meridian: .9996
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: coordinate pair
Coordinate_Representation:
Abscissa_Resolution: 1
Ordinate_Resolution: 1
Planar_Distance_Units: Meters
Geodetic_Model:
Ellipsoid_Name: Geodedic Reference System 80
Semi-major_Axis: 6378137

Denominator_of_Flattening_Ratio: 298.257

Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
The database contains two separate classification systems. The two systems represent vegetation map units and land cover map units. The vegetation map units are usually combinations of vegetation associations described in the TNC companion report. The vegetation map units have also been categorized into 5 general vegetation classes. The land use map units use the Anderson Level II classification system. The vegetation attributes contain character codes and descriptors. The land use contain numeric codes. The descriptors are available in two look-up tables provided with this data set. These are map.lut and anderson.lut. Modifiers also exist representing percent of vegetation cover and tree height. These modifiers are available in the look-up table structure.lut. Contact David Salas at the Bureau of Reclamation Remote Sensing and Geographic Information Group D-8260 for more information about the classification system.
National Park Service/Biological Resources Division Vegetation Inventory and Mapping Program for Jewel Cave National Monument, South Dakota, Final Community Association Classification, May 1, 1998.
Alliance/Community BW=Ash Leaf Maple / Choke Cherry Forest GS=Grass / Shrub Complex P1=Ponderosa Pine Complex 1 P2=Ponderosa Pine Complex II PT=Quaking Aspen / Choke Cherry Forest.

HEIGHT
2 = 0.5 - 1 meters
3 = 1 - 5 meters
4 = 5 - 15 meters
5 = 15 - 30 meters
6 = > 30 meters

DENSITY
1 = Closed/Continuous < 60%
2 = Discontinuous 40% - 60%
3 = Dispersed 25% - 40%
4 = Sparse 10% - 25%

PATTERN
1,'Evenly Dispersed'
2,'Clumped/Bunched'
3,'Gradational/Transitional'
4,'Alternating'

ANDERSON CODE
11 = Residental
12 = Commercial and Services
14 = Transportation, Communications and Utilities
21 = Cropland and Pasture
53 = Reservoirs
62 = Nonforested Wetland
75 = Strip Mines, Quarries, and Gravel Pits

VEGETATION CODE
gplb = Little Bluestem - Grama (Side-Oats, Blue) - Threadleaf Sedge Herbacous Vegetation
wwbg = Weatern-Wheatgrass - Blue Grama - Threadleaf Herbaceous Vegetation

kbg-ws = Kentucky Bluegrass / Western Snowberry Shrubland Mosaic
kbg = Kentucky Bluegrass Disturbed Community
ppbw = Ponderosa Pine / Bearberry Woodland
ppcj = Ponderosa Pine / Common Juniper Woodland
pplb = Ponderosa Pine / Little Bluestem Woodland
ppsf = Ponderosa Pine / Snowberry Forest
ppss = Ponderosa Pine / Sun Sedge Woodland
bw = Ash Leaf Maple / Choke Cherry Forest
pt = Quaking Aspen / Choke Cherry Forest
Entity_and_Attribute_Detail_Citation:
Grossman, D. Et al. 1994. National Park Service/ National Biological Service Vegetation Mapping Project, Standardized National Vegetation Classification System 209 pp.

Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: USGS-NPS Vegetation Mapping Program Coordinator
Contact_Organization: USGS/BRD, Center for Biological Informatics
Contact_Position: Geospatial Technology Specialist
Contact_Address:
Address_Type: Physical Address
Address: USGS Biological Resources
Address: Center for Biological Informatics
Address: Denver Federal Center, Building 810
Address: Room 8000, MS302
City: Denver
State_or_Province: CO
Postal_Code: 80225-0046
Country: USA
Contact_Voice_Telephone: (303) 202-4220
Contact_Facsimile_Telephone: 303-202-4229
Contact_Facsimile_Telephone: 303-202-4219 (org)
Contact_Electronic_Mail_Address: gs-b-npsveg@usgs.gov
Resource_Description: JECA Veg map
Distribution_Liability:
Although these data have been processed successfully on a computer system at the Biological Resources Division, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. This disclaimer applies both to individual use of the data and aggregate use with other data. It is strongly recommended that these data are directly acquired from a Biological Resources Division server, and not indirectly through other sources which may have changed the data in some way. It is also strongly recommended that careful attention be paid to the contents of the metadata file associated with these data. The Biological Resources Division shall not be held liable for improper or incorrect use of the data described and/or contained herein.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: HTML
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:

Network_Address:
Network_Resource_Name: http://biology.usgs.gov/npsveg/jeca/index.html#geospatial_veg_info
Fees: none

Metadata_Reference_Information:
Metadata_Date: 20011022
Metadata_Review_Date: 20060901
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: USGS-NPS Vegetation Mapping Program Coordinator
Contact_Address:
Address_Type: mailing and physical address
Address:
U.S. Geological Survey, Center for Biological Informatics, MS 302,
Room 8000, Building 810, Denver Federal Center
City: Denver
State_or_Province: Colorado
Postal_Code: 80225
Country: USA
Contact_Voice_Telephone: (303) 202-4220
Contact_Facsimile_Telephone: (303) 202-4219
Contact_Electronic_Mail_Address: gs-b-npsveg@usgs.gov
Metadata_Standard_Name: FGDC-STD-001.1-1999 Content Standard for Digital Geospatial Metadata, 1998 Part 1: Biological Data Profile, 1999
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Extensions:
Online_Linkage: http://biology.usgs.gov/fgdc.bio/bionwext.txt
Profile_Name: Biological Data Profile FGDC-STD-001.1-1999